

Borehole

30-12-13**Log Event A****Borehole Information**

Farm : <u>C</u>	Tank : <u>C-112</u>	Site Number : <u>299-E27-125</u>
N-Coord : <u>43,116</u>	W-Coord : <u>48,387</u>	TOC Elevation : <u>644.70</u>
Water Level, ft : <u>117.80</u>	Date Drilled : <u>04/1978</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>120</u>	

Borehole Notes:

A driller's log was not available for this borehole. According to Chamness and Merz (1993), this borehole was drilled in April 1978 and completed to a depth of 130 ft with 6-in.-diameter casing. Chamness and Merz (1993) indicate that grout was added during construction of this borehole; however, they do not indicate how much or where the grout was added.

The casing thickness is assumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. casing. The top of the casing is the zero reference for the log. The casing lip is approximately even with the ground surface. A measure of the top of the casing elevation was not available. The stated elevation was estimated from the tank construction diagrams contained in Brevick et al. (1994b).

Equipment Information

Logging System : <u>1B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>02/1997</u>	Calibration Reference : <u>GJO-HAN-13</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>02/25/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>9.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>02/25/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>8.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>R</u> Shield : <u>N</u>
Finish Depth, ft. : <u>11.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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Log Run Number :	<u>3</u>	Log Run Date :	<u>02/25/1997</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>10.5</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>21.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>4</u>	Log Run Date :	<u>02/26/1997</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>120.5</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>57.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>5</u>	Log Run Date :	<u>02/27/1997</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>58.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>20.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Analysis Information

Analyst : S.D. BarryData Processing Reference : MAC-VZCP 1.7.9Analysis Date : 11/12/1997**Analysis Notes :**

This borehole was logged by the SGLS in five log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation. There were no fine gain adjustments made during these log runs.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137, Co-60, and Eu-154 were detected around this borehole. Cs-137 contamination was detected nearly continuously from the ground surface to 21 ft, from 24 to 26 ft, 30 to 34.5 ft, 44.5 to 46.5 ft, and 118 to 120.5 ft. Isolated occurrences of Cs-137 contamination were detected at 39 and 40.5 ft. Co-60 contamination was measured from 26.5 to 41.5 ft and 46 to 49.5 ft. Eu-154 contamination was measured from 36 to 37 ft. A region of high dead time was detected from 9.5 to 10 ft.

The K-40 concentrations increase slightly at about 10 ft and become variable from 10 to 42 ft. K-40 concentrations increase at about 42 ft and remain elevated to the bottom of the logged interval. From 43 to 45 ft, the U-238 concentrations are slightly elevated relative to the rest of the logged interval.

An analysis of the shape factors associated with applicable segments of the spectra was performed. The shape factors provide insights into the distribution of the Cs-137 contamination, Co-60 contamination, and the nature of zones of elevated total count gamma-ray activity not attributable to gamma-emitting radionuclides.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank C-112.



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Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Plots of the spectrum shape factors are included. The plots are used as an interpretive tool to help determine the radial distribution of man-made contaminants around the borehole.

A time sequence plot of the historical gross gamma log data from May 1978 to May 1992 was generated and is included in the suite of SGLS logs.